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EXAMINER	
FINDLEY, CHRISTOPHER G	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/603,428	SHEN, BO	
	Examiner	Art Unit	
	Christopher Findley	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 8/6/2007 have been fully considered but they are not persuasive.

Re claims 1-27 rejected under 35 U.S.C. §101, the Applicant alleges that no grounds were provided for the rejection. However, the Examiner respectfully notes that in the original office action dated 5/2/2007, on page 2, lines 10-11, the Examiner stated that an output step is required in order to produce a useful, concrete, and tangible result.

Re claim 10, the amendments to the claim are insufficient to overcome the previous rejection under 35 U.S.C. §101. The computer program must be embodied on a "computer *readable* medium." Furthermore, the computer program stored on the computer readable medium must include the steps for performing the method as claimed. As the claim presently reads, the computer program could simply be a "start instruction" for causing a separate program stored within the computer to commence, which is not statutory. Therefore, the computer program needs to be more closely associated with the computer readable medium in the claim language.

Re claims 1, 10, and 19, the Applicant argues that the combination of embodiments from Yoo is improper and teaches away from the suggested modification (Remarks page 8, lines 21-24, filed 8/6/2007). The Examiner acknowledges that the combination of embodiments from Yoo Fig. 3 and Yoo Fig. 4 is improper. However, the

Examiner also notes that Apostolopoulos discloses both a buffer for temporarily storing an intermediate result (Apostolopoulos: column 23, lines 36-42, the output buffer contains the entropy-coded data before it is organized into a predictively-coded block-based picture signal) and a step of controlling quantization to achieve a certain bit-rate based upon the data stored in the buffer (Apostolopoulos: column 23, lines 42-47, this process must involve a determination of available memory and processing resources). Since no new reference has been introduced to address claims 1, 10, and 19, the rejection of claims 1, 10, and 19 under Yoo in view of Apostolopoulos is maintained.

The Applicant further argues that motivation for combining Apostolopoulos with Yoo (Remarks page 11, lines 22-24, filed 8/6/2007) and combining Panusopone with Yoo and Apostolopoulos (Remarks page 13, lines 11-13, filed 8/6/2007) for a prime facie case of obviousness is lacking. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Yoo and Apostolopoulos and to combine Yoo and Apostolopoulos and Panusopone was found in knowledge generally available to one of ordinary skill in the art.

The remaining arguments pertain to the allowability of dependent claims 2-9, 11-18, and 20-27 based upon the alleged deficiencies of Yoo, Apostolopoulos, and Panusopone regarding independent claims 1, 10, and 19. Therefore, the Examiner maintains the previous rejections for claims 2-9, 11-18, and 20-27.

A modified copy of the original office action is included below.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The invention as claimed in claims 1-27 does not produce a useful, concrete, and tangible result. In order to produce a useful, concrete, and tangible result, an output step is required.

Independent claim 10 recites "A computer useable medium having computer useable code embodied therein causing a computer to perform operations comprising..." that fails to meet the statutory requirement set forth in the Interim Guidelines, Annex IV (a) and (b):

(a) Functional Descriptive Material: "Data Structures" Representing Descriptive Material Per Se or Computer Programs Representing Computer Listings Per Se

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer.

The program has to be embodied in a computer *readable* medium. Claim 10 fails to recite this aspect.

(b) Nonfunctional Descriptive Material

Nonfunctional descriptive material that does not constitute a statutory process, machine, manufacture or composition of matter and should be rejected under 35 U.S.C. § 101. Certain types of descriptive material, such as music, literature, art, photographs and mere arrangements or compilations of facts or data, without any functional interrelationship is not a process, machine, manufacture or composition of matter.

The computer program as claimed is not properly associated with the operation. It is possible that the computer program may be an unrelated sub-routine or a simple "commence" instruction, which then causes the computer to execute the operation that could be self-resident, and not encoded on the medium. The Examiner suggests that the computer program be more directly associated with the operation.

Claim 10 should recite "A computer readable medium stored thereon a computer program directed to steps for causing a computer to execute the method comprising..."

Claims 11-18 are dependent upon claim 10.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 9-14, and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoo et al. (US 6999512 B2) in view of Apostolopoulos et al. (US 6404814 B1).

Re claim 1, Yoo discloses a method for servicing streaming media comprising: receiving said streaming media (Yoo: Fig. 4, MPEG-1 BITSTREAM input); and performing a multi-stage service on said streaming media (Yoo: Fig. 4, data is parsed in multiple stages: sequence header, GOP header, picture header, etc.). Yoo does not specifically disclose determining an allocation of available processing and memory resources and selecting intermediate results according to the available processing and memory resources; and caching an intermediate result from one of the stages of said multi-stage process. However, Apostolopoulos discloses a transcoding method in which buffer data is managed to prevent overflow or underflow (Apostolopoulos: column 8, lines 32-36) and processing resources available are taken into account (Apostolopoulos: column 31, lines 39-43) while performing the transcoding operation. Furthermore, Apostolopoulos discloses that an output buffer may be included for storing entropy coded blocks into a predictively coded block-based picture signal that is compliant with a standard decoder (Apostolopoulos: column 23, lines 36-47). Since

both Yoo and Apostolopoulos disclose transcoders, which perform transcoding operations between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the memory and processing management of Apostolopoulos with the transcoding operation of Yoo in order to save processing resources by operating in the coded domain (Apostolopoulos: column 4, lines 43-46). The method of Yoo, now implemented in conjunction with the method of Apostolopoulos, has all of the features of claim 1.

Re claim 2, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses performing a computing-intensive service on the streaming media (Yoo: Fig.5; column 9, lines 38-49; quantization is computing-intensive), as in the claim.

Re claim 3, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses everything claimed, as applied above (see claims 1 and 2). In addition, Yoo discloses that the processing resource is a transcoder (Yoo: Abstract section). Yoo does not specifically disclose that the group of resources includes a first cache, and a second cache. However, Apostolopoulos discloses a transcoder, wherein the transcoder can additionally include an output buffer (Apostolopoulos: column 23, lines 36-47, an output buffer may generate a feedback signal for controlling quantization step size) and an input buffer constraint may also be used for determining a target bit-rate (Apostolopoulos: column 23, lines 36-47). Therefore, the processing capabilities of either a first cache (output buffer in Apostolpoulos) or a second cache (input buffer in

Apostolopoulos) may be used to control the data bit-rate, and ,consequently, the data stored in the buffers. Since both Yoo and Apostolopoulos disclose transcoders, which perform transcoding operations between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the bit-rate/memory management of Apostolpoulos with the transcoding operation of Yoo in order to ensure that the bit-rate complies with a predetermined constraint, thereby preventing buffer overflow or underflow (Apostolopoulos: column 8, lines 32-36). The method of Yoo, now implemented in conjunction with the method of Apostolopoulos, has all of the features of claim 3.

Re claim 4, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses that the media service comprises transcoding functions (Yoo: Abstract section), as in the claim.

Re claim 5, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses that the media service result is a final transcoding result (Yoo: Fig. 4; column 6, lines 4-15 (the final result of the transcoder is a transcoded bitstream)), as in the claim.

Re claim 9, the combined method of Yoo and Apostolopoulos discloses a majority of the features of claim 9, as discussed above in claims 1 and 4. Additionally, Yoo discloses that transcoding functions are performed by resources selected from the group that consist of bit rate controller (Yoo: Fig. 4, block 420 "bit_rate") and parser

(Yoo: Fig. 4, blocks 402, 404, 406, 408, 410, and 412), but Yoo does not specifically disclose that the group includes a motion vector generator. However, Apostolopoulos discloses a transcoder that includes a motion vector generator (Apostolopoulos: column 8, line 65, through column 9, line 11). Since both Yoo and Apostolopoulos disclose transcoders, which perform transcoding operations between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the memory and processing management of Apostolopoulos with the transcoding operation of Yoo in order to save processing resources by selecting the lowest cost motion vectors and optimizing coding efficiency (Apostolopoulos: column 36, lines 56-67). The method of Yoo, now implemented in conjunction with the method of Apostolopoulos, has all of the features of claim 1.

Claim 10 describes the corresponding computer readable medium thereon stored a computer program directed to steps for executing the method of claim 1 and, therefore, has been analyzed and rejected with respect to claim 1 above.

Claim 11 has been analyzed and rejected with respect to claim 2 above.

Claim 12 has been analyzed and rejected with respect to claim 3 above.

Claim 13 has been analyzed and rejected with respect to claim 4 above.

Claim 14 has been analyzed and rejected with respect to claim 5 above.

Claim 19 describes the corresponding apparatus for implementing the method of claim 1 and, therefore, has been analyzed and rejected with respect to claim 1 above.

Claim 20 has been analyzed and rejected with respect to claim 2 above.

Claim 21 has been analyzed and rejected with respect to claim 3 above.

Re claim 22, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses that the intermediate transcoding result is selected from any of the respective stages of said multistage service (Yoo: Fig. 4, Blocks 402, 406, 410, and 412 each provide intermediate data before the MPEG-1 bitstream is coded as an MPEG-4 bitstream and, therefore, intermediate data is available from a plurality of stages), as in the claim.

Re claim 23, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses a majority of the features of claim 23, as discussed above in claim 19. Yoo does not specifically disclose that the result is selected to optimize the balance of processing and memory resources used in providing said service. However, Apostolopoulos discloses a transcoder, wherein motion vectors with the smallest cost are used, where the cost may relate to processing constraints (MSE, MAE, etc.) or memory constraints (the number of bits required to code the MC-residual) (Apostolopoulos: column 36, lines 1-7 and 56-67). Since both Yoo and Apostolopoulos disclose transcoders, which perform transcoding operations between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the bit-

rate/memory management of Apostolpoulos with the transcoding operation of Yoo in order to ensure that the bit-rate complies with a predetermined constraint, thereby preventing buffer overflow or underflow (Apostolopoulos: column 8, lines 32-36). The method of Yoo, now implemented in conjunction with the method of Apostolopoulos, has all of the features of claim 23.

6. Claims 6-8, 15-18, and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoo et al. (US 6999512 B2) and Apostolopoulos et al. (US 6404814 B1) as applied to claims 1-5, 10-14, and 19-23 above, and further in view of Panusopone et al. (US 6647061 B1).

Re claim 6, the method of Yoo, now implemented in conjunction with the method of Apostolopoulos, discloses a majority of the features of claim 6 as discussed above concerning claims 1-5, and additionally that transcoding functions are selected from the group consisting of bit rate reduction (Yoo: Fig. 4, block 420 "bit_rate") and resolution reduction (Yoo: Fig. 4, block 420 "vop_width" and "vop_height"). However, the combined method of Yoo and Apostolopoulos does not specifically disclose frame rate reduction as a transcoding function. Panusopone does disclose a transcoding apparatus, which performs frame rate reduction (Panusopone: column 19, lines 9-13). Since Yoo, Apostolopoulos, and Panusopone all relate to performing transcoding between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings to reduce the complexity of the transcoding system

(Panusopone: column 3, lines 35-37) by determining similarities between the MPEG-1/MPEG-2 and MPEG-4 data (Panusopone: column 2, lines 64-67), thus needing to only partially decompress the input bitstream and re-compress the bitstream into a different output format (Panusopone: column 3, lines 47-55). The combined method of Yoo and Apostolopoulos, now implemented in the apparatus of Panusopone, has all of the features of claim 6.

Re claim 7, the combined method of Yoo and Apostolopoulos, now implemented in the apparatus of Panusopone, discloses a majority of the features of claim 7, as discussed above in claim 1. Yoo does not specifically disclose that caching (buffering) comprises caching (buffering) intermediate transcoding results of an output stream of said streaming media provided a target bit rate of said output stream of said streaming media is greater than a data caching (buffering) rate of said streaming media. However, Apostolopoulos discloses a transcoding method, wherein a desired bit rate (i.e., target bit rate) is determined (Apostolopoulos: column 31, lines 39-43) and the bit-rate is varied according to buffer constraints (Apostolopoulos: column 23, lines 42-47), ensuring that the buffer does not underflow (Apostolopoulos: column 8, lines 32-36). Since Yoo, Apostolopoulos, and Panusopone all relate to performing transcoding between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the bit-rate/memory management of Apostolpoulos with the transcoding operation of Yoo in order to ensure that the bit-rate complies with a predetermined constraint, thereby preventing buffer overflow or underflow

(Apostolopoulos: column 8, lines 32-36), which conventionally occurs when the rate of the data leaving the buffer (target bit rate) exceeds the rate of data entering the buffer (buffering/caching rate)), as in the claim. The method of Yoo, now implemented in conjunction with the method of Apostolopoulos, has all of the features of claim 7.

Re claim 8, the combined method of Yoo and Apostolopoulos, now implemented in the apparatus of Panusopone, discloses a majority of the features of claim 8, as discussed above in claims 1 and 7. Additionally, Yoo discloses that intermediate transcoding results comprise meta data that is selected from the group consisting of block (Yoo: Fig. 4, block 412), macroblock (Yoo: Fig. 4, block 410), picture (Yoo: Fig. 4, block 406) and sequence (Yoo: Fig. 4, block 402). Yoo does not specifically disclose that the meta data group includes pixel data. However, Panusopone discloses a transcoder, wherein processing operations are performed on a pixel level (Panusopone: column 3, line 66, through column 4, line 4). Since Yoo, Apostolopoulos, and Panusopone all relate to performing transcoding between traditional MPEG-1/MPEG-2 bitstreams and more contemporary MPEG-4 bitstreams, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the pixel averaging of Panusopone with the transcoding operations of Yoo and Apostolopoulos in order to provide a system capable of generating scaled coded images (Panusopone: column 4, lines 44-50). The method of Yoo, now implemented in conjunction with the method of Apostolopoulos, has all of the features of claim 8.

Claim 15 has been analyzed and rejected with respect to claim 6 above.

Claim 16 has been analyzed and rejected with respect to claim 7 above.

Claim 17 has been analyzed and rejected with respect to claim 8 above.

Claim 18 has been analyzed and rejected with respect to claim 9 above.

Claim 24 has been analyzed and rejected with respect to claim 6 above.

Claim 25 has been analyzed and rejected with respect to claim 7 above.

Claim 26 has been analyzed and rejected with respect to claim 8 above.

Claim 27 has been analyzed and rejected with respect to claim 9 above.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Signal processing

Saunders et al. (US 20020136310 A1)

b. Video transcoder with spatial resolution reduction

Vetro et al. (US 20030016751 A1)

c. Bitstream transcoder

Nakamura et al. (US 20030227974 A1)

d. Video transcoding using syntactic and semantic clues

Vetro et al. (US 6574279 B1)

e. Information processing method and apparatus

Horiguchi et al. (US 20040013399 A1)

f. Code quantity control apparatus, code quantity control method and picture information transformation method

Sato (US 20020136295 A1)

g. Video transcoding apparatus

Kim (US 20020126752 A1)

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Findley whose telephone number is (571) 270-1199. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (571) 272-7905. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Findley/

Marsha D Banks-Harold

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